Research Paper | Education | E-ISSN No : 2454-9916 | Volume : 8 | Issue : 7 | Jul 2022

EXPLORING VIRTUAL REALITY AND AUGMENTED REALITY IN TEACHING HUMAN ANATOMY

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ABSTRACT

The teaching of Human Anatomy has undergone many changes in the last twenty years. The introduction of new technology to better enable students understanding of a complex 3-dimensional subject has reached new levels. Although intuitively the results seem that technology in service of androgogy prevail, there are still some educators who cannot accept different modes of delivery that are not classical in nature. Important to bring together the teaching community to discuss and keep the 21st century learner front and centre in the debate.

KEY WORDS: Anatomy, Virtual Reality, Charette, Androgogy.

INTRODUCTION:
Situated in the midst of Canada's largest and most diverse health care market, George Brown College's Centre for Health Sciences has created a new purpose-built campus at Toronto's waterfront that serves as a beacon for an innovative, practical and interprofessional approach to health care education and care.

The interprofessional learning model is a multidimensional way of learning emphasizing a blended approach to the acquisition of knowledge. One common course that is embedded in all our health sciences programs is Human Anatomy. There is much excitement and some trepidation of changing existing curricula. Thus, a Charette was commissioned to bring everyone together to understand the ramifications of changing the delivery mode of teaching human anatomy.

METHODOLOGY:
In order to have a lively discussion about VR and Augmented reality usage in the delivery of human anatomy a collective meeting of stakeholders was convened. A Charette was organized through the Office of the Provost and had a varied membership of participants. Professors, lab techs, simulation experts, teaching and learning exchange tutors, industry and students were included. A full day agenda was created and the Charette was performed through a technique of appreciative inquiry.

A charrette is a creative working session that condenses the design and ideation process to foster creativity through collaboration. Charrettes create a framework for design that encourages participants to step outside their comfort zones, consider new perspectives and generate creative results. Over a period of brainstorming, discussion and consultation, participants create a broad range of ideas around a central theme or objective. Because participants are generally diverse, representing users and stakeholders, the results are practical and meet objectives comprehensively. (Ross, Kondruss, 2018).

Two questions needed to be asked and about andrological issues relating to the teaching of anatomy. The questions focused on content and process. First question was, "what anatomical facts does every competent practitioner need to know?" and the second was "what instructional or educational method(s) will likely succeed in attaining the desired learning objectives?" (Ross, 2015).

DISCUSSION AND RESULTS:
Throughout the ages there has been great debate as to how to teach human anatomy in medical, dental and para- allied health programs. Recognizing that anatomy knowledge is foundational and pivotal to the practice of medicine and health, the need for revising curriculum with respect to delivery mode has been considered for years. Historically dissection and pro-section was the norm for learning anatomy. Today the use of virtual reality and augmented reality are causing a huge disruption in our belief that dissection and pro-section are not the only ways to teaching anatomy. In a study looking into the effectiveness of teaching anatomy by virtual reality Zhao et al 2020 reported that there were some downsides to this practice. Researchers noted that the experience involving complicated anatomical configuration lead to disorientation and frustration (Moro et al.2017). The authors cited from another study that virtual reality could result in cybersickness, such as nausea, disorientation and headache (Rebenitsch et al. 2016). Due to these listed problems it was proposed that virtual reality would only be used to augment the teaching. During the charette a number of positive findings were articulated for blending the teaching of anatomy in a hybrid fashion. The benefits were: 1. Students may learn, practice and review on their own time. 2. No chemical sensitivity to the embalming formaldehyde chemicals used in the embalming practice. 3. Students are able to observe the topography of the body through different views. 4. Any mistakes made in viewing are easily corrected unlike what happens in dissection. 5. VR mode of delivery was in keeping with the personalization of education. The concept of learning anywhere, anytime and having full remedial capabilities was seen as a great advantage to the learning process.

CONCLUSION:
The teaching and learning of human anatomy has in the past 20 years entered into a new phase with the introduction of new ways technological delivery modes. Virtual reality and augmented reality are being used much more frequently in curriculum across medical schools and other health science disciplines. In keeping with the new age learners that all of us see in our classrooms today it will become imperative to find the right androgological balance in delivering anatomy curricula. The debate on the value of dissection is still a hot topic in the medical and health science field. Many researchers are in favor of dissection but also need to incorporate the advanced imaging techniques currently available (De Iuliis and Pulera 2019). The key to success to this androgological puzzle will be in the sequencing the hybrid approach. Without a doubt a balance between classical and modern teaching will lead to extremely knowledgeable practitioners and teachers of the healing arts.

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